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EXAMINER

MCCLELLAND, KIMBERLY KEIL

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

07/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/826,816

Applicant(s)

CREDELLE ET AL.

Examiner

KIMBERLY K. MCCLELLAND

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 25-29 is/are pending in the application.
4a) Of the above claim(s) 48-53 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-23 and 25-29 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,683,663 to Hadley et al.
3. With respect to claim 1, Hadley et al. discloses an apparatus for web fabrication, including a relocating tool having a first plurality of receptor sites having a plurality of functional blocks deposited therein, wherein at least one of said receptor sites is a recessed region within said relocating tool, the recessed region designed to closely fit at least a portion of a single functional block; a moving mechanism coupled to the relocating tool to move the relocating tool from a fluidic assembly environment to another environment; and a transfer tool having a plurality of nozzles which are in alignment with said first plurality of receptor sites, said transfer tool being able to remove said plurality of functional blocks from said relocating tool and deposit said plurality of functional blocks into a second plurality of receptor sites in said substrate (see Figures 28-38 and column 13, line 8-column 15, line 15).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,742,561 to Nam et al. in view of U.S. Patent No. 4,914,809 to Fukai et al.

6. With respect to claim 28, Nam et al. discloses an apparatus for die bonding, including a relocating tool (56) having a first plurality of receptor sites having a plurality of functional blocks (72) deposited therein; and a transfer tool (52/54) coupling to an adhesive layer (68); said transfer tool to transfer said plurality of functional blocks (72) from said relocating tool to a substrate (60) wherein said plurality of functional blocks adhere to said adhesive layer (See Figure 4). However, Nam et al. does not specifically disclose the receptor site is a recessed region designed to closely fit at least a portion of

a single functional block or a moving mechanism coupled to the relocating tool to move the relocating tool. The phrase, "from a fluidic assembly environment to another environment" is considered intended use of the current apparatus.

7. Fukai et al. discloses a chip mounting apparatus, including the receptor site is a recessed region (13a/13b/13c) designed to closely fit at least a portion of a single functional block and a moving mechanism (101) coupled to the relocating tool to move the relocating tool (See Figures 2-3). The moving mechanism is capable of moving the relocating tool from a fluidic assembly environment to another environment. It is noted that the rejection is over apparatus claims not method claims. The prior art only has to provide a structure that is capable of performing in the manner claimed and not necessarily have ever been intended to be used in this manner. It is the examiner's position that Fukai et al. meets the limitations of the instant claims. If the applicant were to establish that significant structural differences exist with the prior art apparatus which would make it incapable of performing the evacuation step and amend the claims appropriately, the art rejection over the apparatus claims will be withdrawn. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the recessed receptor sites and moving mechanism taught by Fukai et al. with the relocation tool disclosed by Nam et al. The motivation would have been to improve alignment of the functional blocks on the relocation tool and move the relocating tool back and forth, providing horizontal displacement.

8. As to claim 29, Nam et al. discloses a vacuum source (6) coupling to said transfer tool (52/54), said vacuum source adheres said adhesive layer (68) to said transfer tool (See Figures 5C-5D).

9. Claims 1, 3, and 6-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,742,561 to Nam et al. in view of U.S. Patent No. 6,511,048 to Bayan et al., U.S. Patent No. 5,904,545 to Smith et al., and U.S. Patent No. 4,914,809 to Fukai et al.

10. With respect to claim 1, Nam et al. discloses an apparatus for die bonding, including a relocating tool (56) having a first plurality of receptor sites having a plurality of functional blocks (72) deposited therein; and a transfer tool (54), said transfer tool being able to remove said plurality of functional blocks (72) from said relocating tool (56) and deposit said plurality of functional blocks (72) into a second plurality of receptor sites in said substrate (68; See Figure 4). However, Nam et al. does not specifically disclose a plurality of nozzles on the transfer tool, the receptor site is a recessed region designed to closely fit at least a portion of a single functional block, or a moving mechanism coupled to the relocating tool to move the relocating tool. The phrase, "from a fluidic assembly environment to another environment" is considered intended use of the current apparatus.

11. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable

significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Nam et al. The motivation would have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

12. Smith et al. discloses an apparatus for fabricating micro-structures, including the receptor site is a recessed region designed to closely fit at least a portion of a single functional block (See Figures 6-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the recessed receptor sites taught by Smith et al. with the relocation tool disclosed by Nam et al. The motivation would have been to improve alignment of the functional blocks on the relocation tool (column 10, lines 47-57).

13. Fukai et al. discloses a chip mounting apparatus, including a moving mechanism (101) coupled to the relocating tool to move the relocating tool (See Figures 2-3). The moving mechanism is capable of moving the relocating tool from a fluidic assembly environment to another environment. It is noted that the rejection is over apparatus claims not method claims. The prior art only has to provide a structure that is capable of performing in the manner claimed and not necessarily have ever been intended to be used in this manner. It is the examiner's position that Fukai et al. meets the limitations of the instant claims. If the applicant were to establish that significant structural differences exist with the prior art apparatus which would make it incapable of

performing the evacuation step and amend the claims appropriately, the art rejection over the apparatus claims will be withdrawn. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the moving mechanism taught by Fukai et al. with the relocation tool disclosed by Nam et al. The motivation would have been to move the relocating tool back and forth, providing horizontal displacement between supply and transfer means.

14. As to claim 3, Nam et al. discloses an adhesive dispensing device (74) to dispense adhesive (68) into said second plurality of receptor sites in said substrate before said plurality of functional blocks are deposited into said second plurality of receptor sites (See Figure 4).

15. As to claim 6, Nam et al. discloses second plurality of receptor sites (24) being configured to mate with said plurality of functional blocks (25; See Figure 2).

16. As to claim 7, Nam et al. discloses said plurality of receptor sites have any one of a trapezoidal shape, a rectangular shape, a square shape, and a cylindrical shape (See Figure 4).

17. The shape of the functional blocks is interpreted as the material being acted upon in the apparatus. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Consequently, this limitation has not been given patentable weight.

18. As to claim 8, Nam et al. does not specifically disclose asymmetrically shaped receptor sites. The shape of the functional blocks is not given patentable weight.

19. Smith et al. discloses an apparatus for fabricating micro-structures, including it is known in the art to use any shaped receptor sites (column 13, lines 46-56). Examiner asserts the disclosure of "any block having shaped features" teaches blocks are not limited to symmetrical shapes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute asymmetrical shaped receptor sites for symmetrical blocks, because the different shapes are functional equivalents.

Substitution of equivalents requires no express motivation. In re Fount, 213 USPQ 532 (CCPA 1982); In re Siebentritt 152, USPQ (CCPA 1967).

20. As to claim 9, Nam et al. does not specifically disclose transfer tool (54) is further coupled to a vacuum source conveying vacuum to said nozzles. However, the similar transfer tool of Nam et al. (52) is disclosed as being operated by a vacuum (column 4, lines 30-43). Examiner asserts it would have been obvious to one of ordinary skill in the art at the time the invention was made to operate the second transfer tool of Nam et al. under vacuum. The motivation would have been to temporarily constrain the die during transport.

21. As to claim 10, Nam et al. discloses all of said first plurality of receptor sites have same dimensions and shapes (See Figure 4).

22. As to claim 11, Nam et al. does not specifically disclose said first plurality of receptor sites comprises of different size and shape receptor sites.

23. Bayan et al. discloses an off-load system for semiconductor devices, including said first plurality of receptor sites comprises of different size and shape receptor sites (column 5, lines 29-50). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to combine the different size and shape receptor sites taught by Bayan et al. with the receptor sites of Nam et al. The motivation would have been to allow various sized blocks to be positioned in various orientations.

24. As to claim 12, Nam et al. discloses said plurality of nozzles has a dimension that is smaller than a dimension of said plurality of functional blocks (See Figure 5C).

25. As to claim 13, Nam et al. does not specifically disclose said plurality of functional blocks are deposited in said relocating tool by an FSA device using a slurry to deposit said plurality of functional blocks into said plurality of receptor sites.

26. Smith et al. discloses an apparatus for fabricating microstructures, including said plurality of functional blocks are deposited in said relocating tool by an FSA device using a slurry to deposit said plurality of functional blocks into said plurality of receptor sites (column 11, lines 5-8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the FSA depositing step of Smith et al. for the wafer of Nam et al. The motivation would have been to provide evenly spaced and aligned blocks and allow for devices that are not in wafer form.

27. As to claim 14, Nam et al. discloses a drying device (column 4, lines 55-56).

28. As to claim 15, Nam et al. discloses a curing device (column 1, lines 59-62).

29. As to claim 16, Nam et al. discloses a relocating tool having a first plurality of receptor sites (56) having a plurality of functional blocks (72) deposited therein; a transfer tool (54), said transfer tool being able to remove said plurality of functional blocks (72) from said relocating tool (56) and deposit said plurality of functional blocks into said substrate (68) wherein said substrate is made out of a thermoset material

(column 2, lines 7-14; See Figure 4). However, Nam et al. does not specifically disclose a plurality of nozzles on the transfer tool, the receptor site is a recessed region designed to closely fit at least a portion of a single functional block, or a moving mechanism coupled to the relocating tool to move the relocating tool. The phrase, "from a fluidic assembly environment to another environment" is considered intended use of the current apparatus.

30. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Nam et al. The motivation would have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

31. Smith et al. discloses an apparatus for fabricating micro-structures, including the receptor site is a recessed region designed to closely fit at least a portion of a single functional block (See Figures 6-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the recessed receptor sites taught by Smith et al. with the relocation tool disclosed by Nam et al. The motivation would have been to improve alignment of the functional blocks on the relocation tool (column 10, lines 47-57).

32. Fukai et al. discloses a chip mounting apparatus, including a moving mechanism (101) coupled to the relocating tool to move the relocating tool (See Figures 2-3). The moving mechanism is capable of moving the relocating tool from a fluidic assembly environment to another environment. It is noted that the rejection is over apparatus claims not method claims. The prior art only has to provide a structure that is capable of performing in the manner claimed and not necessarily have ever been intended to be used in this manner. It is the examiner's position that Fukai et al. meets the limitations of the instant claims. If the applicant were to establish that significant structural differences exist with the prior art apparatus which would make it incapable of performing the evacuation step and amend the claims appropriately, the art rejection over the apparatus claims will be withdrawn. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the moving mechanism taught by Fukai et al. with the relocation tool disclosed by Nam et al. The motivation would have been to move the relocating tool back and forth, providing horizontal displacement between supply and transfer means.

33. The circuitry components of the functional blocks are interpreted as the material being acted upon in the apparatus. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Consequently, this limitation has not been given patentable weight.

34. Also, the phrase, "wherein said substrate is hot when said plurality of functional blocks are being deposited" is considered functional language. The examiner would like

to note that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original). A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP § 2114. Examiner has found the phrase, "wherein said substrate is hot wherein said plurality of functional blocks are being deposited" Does not provide any structural limitations to the current apparatus.

35. As to claim 17, Nam et al. discloses a heating device capable of heating said substrate to above a softening point (column 2, lines 25-30).

36. Claims 1, 9, 12, and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,765,277 to Jin et al. in view of U.S. Patent No. 6,511,048 to Bayan et al., U.S. Patent No. 5,904,545 to Smith et al., and U.S. Patent No. 4,914,809 to Fukai et al.

37. With respect to claim 1, Jin et al. discloses a die bonding apparatus, including a relocating tool (50) having a first plurality of receptor sites having a plurality of functional

blocks (57) deposited therein; and a transfer tool (60), said transfer tool being able to remove said plurality of functional blocks (57) from said relocating tool (50) and deposit said plurality of functional blocks (57) into a second plurality of receptor sites in said substrate (55; See Figure 5). However, Jin et al. does not specifically disclose a plurality of nozzles on the transfer tool, the receptor site is a recessed region designed to closely fit at least a portion of a single functional block, or a moving mechanism coupled to the relocating tool to move the relocating tool. The phrase, "from a fluidic assembly environment to another environment" is considered intended use of the current apparatus.

38. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The motivation would have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

39. Smith et al. discloses an apparatus for fabricating micro-structures, including the receptor site is a recessed region designed to closely fit at least a portion of a single functional block (See Figures 6-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the recessed receptor sites

taught by Smith et al. with the relocation tool disclosed by Jin et al. The motivation would have been to improve alignment of the functional blocks on the relocation tool (column 10, lines 47-57).

40. Fukai et al. discloses a chip mounting apparatus, including a moving mechanism (101) coupled to the relocating tool to move the relocating tool (See Figures 2-3). The moving mechanism is capable of moving the relocating tool from a fluidic assembly environment to another environment. It is noted that the rejection is over apparatus claims not method claims. The prior art only has to provide a structure that is capable of performing in the manner claimed and not necessarily have ever been intended to be used in this manner. It is the examiner's position that Fukai et al. meets the limitations of the instant claims. If the applicant were to establish that significant structural differences exist with the prior art apparatus which would make it incapable of performing the evacuation step and amend the claims appropriately, the art rejection over the apparatus claims will be withdrawn. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the moving mechanism taught by Fukai et al. with the relocation tool disclosed by Jin et al. The motivation would have been to move the relocating tool back and forth, providing horizontal displacement between supply and transfer means.

41. As to claim 9, Jin et al. does not specifically disclose transfer tool (54) is further coupled to a vacuum source conveying vacuum to said nozzles. However, the similar transfer tool of Jin et al. (52) is disclosed as being operated by a vacuum (column 4, lines 30-43). Examiner asserts it would have been obvious to one of ordinary skill in the

art at the time the invention was made to operate the second transfer tool of Jin et al. under vacuum. The motivation would have been to temporarily constrain the die during transport.

42. As to claim 12, Jin et al. discloses said plurality of nozzles has a dimension that is smaller than a dimension of said plurality of functional blocks (See Figure 6).

43. As to claim 16, Jin et al. discloses a relocating tool having a first plurality of receptor sites (50) having a plurality of functional blocks (57) deposited therein; a transfer tool (51), said transfer tool being able to remove said plurality of functional blocks (57) from said relocating tool (50) and deposit said plurality of functional blocks (57) from said relocating tool (50) and deposit said plurality of functional blocks (57) into said substrate (55) wherein said substrate is made out of a thermoset material (column 1, lines 44-56; See Figure 5). However, Jin et al. does not specifically disclose a plurality of nozzles on the transfer tool, the receptor site is a recessed region designed to closely fit at least a portion of a single functional block, or a moving mechanism coupled to the relocating tool to move the relocating tool. The phrase, "from a fluidic assembly environment to another environment" is considered intended use of the current apparatus.

44. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the

transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The motivation would have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

45. Smith et al. discloses an apparatus for fabricating micro-structures, including the receptor site is a recessed region designed to closely fit at least a portion of a single functional block (See Figures 6-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the recessed receptor sites taught by Smith et al. with the relocation tool disclosed by Jin et al. The motivation would have been to improve alignment of the functional blocks on the relocation tool (column 10, lines 47-57).

46. Fukai et al. discloses a chip mounting apparatus, including a moving mechanism (101) coupled to the relocating tool to move the relocating tool (See Figures 2-3). The moving mechanism is capable of moving the relocating tool from a fluidic assembly environment to another environment. It is noted that the rejection is over apparatus claims not method claims. The prior art only has to provide a structure that is capable of performing in the manner claimed and not necessarily have ever been intended to be used in this manner. It is the examiner's position that Fukai et al. meets the limitations of the instant claims. If the applicant were to establish that significant structural differences exist with the prior art apparatus which would make it incapable of performing the evacuation step and amend the claims appropriately, the art rejection over the apparatus claims will be withdrawn. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the moving

mechanism taught by Fukai et al. with the relocation tool disclosed by Jin et al. The motivation would have been to move the relocating tool back and forth, providing horizontal displacement between supply and transfer means.

47. The circuitry components of the functional blocks are interpreted as the material being acted upon in the apparatus. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Consequently, this limitation has not been given patentable weight.

48. Also, the phrase, "wherein said substrate is hot wherein said plurality of functional blocks are being deposited" is considered functional language. The examiner would like to note that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original). A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP § 2114. Examiner has found the phrase, "wherein said substrate is hot when said plurality of

functional blocks are being deposited" Does not provide any structural limitations to the current apparatus.

49. As to claim 17, Jin et al. discloses a heating device capable of heating said substrate to above a softening point (column 1, lines 44-56).

50. As to claim 18, Jin et al. discloses a curing device to cure said substrate (column 1, lines 44-56).

51. As to claim 19, Jin et al. discloses a transfer tool (51/53), said transfer tool to remove a plurality of functional blocks (57) formed on a first substrate (50) from said first substrate; a transfer station to invert (52) said plurality of functional blocks; and wherein said transfer tool (51/53) to pick up inverted functional blocks and deposit said inverted functional blocks onto a second substrate having a plurality of receptor sites (column 4, lines 23-30; See Figure 5). However, Jin et al. does not specifically disclose a plurality of nozzles on the transfer tool, the receptor site is a recessed region designed to closely fit at least a portion of a single functional block.

52. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The motivation would

have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

53. Smith et al. discloses an apparatus for fabricating micro-structures, including the receptor site is a recessed region designed to closely fit at least a portion of a single functional block (See Figures 6-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the recessed receptor sites taught by Smith et al. with the relocation tool disclosed by Jin et al. The motivation would have been to improve alignment of the functional blocks on the relocation tool (column 10, lines 47-57).

54. As to claim 20, Jin et al. discloses a second transfer tool (53) is used to pick up a inverted functional blocks and deposit said inverted blocks onto said second substrate having a plurality of receptor sites (See Figure 5). However, Jin et al. does not specifically disclose a plurality of nozzles on the second transfer tool.

55. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The motivation would have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

56. As to claim 21, Jin et al. does not specifically disclose said plurality of receptor sites has a matching pattern with said plurality of nozzles on said transfer tool.

57. Bayan et al. discloses an off-load system for semiconductor devices, including said plurality of receptor sites (40) has a matching pattern with said plurality of nozzles on said transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the matching nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The motivation would have been to allow for simultaneous transfer of multiple devices with proper alignment, thus improving unit output.

58. As to claim 22, Jin et al. does not specifically disclose said plurality of receptor sites has a matching pattern with said another plurality of nozzles on said another transfer tool.

59. Bayan et al. discloses an off-load system for semiconductor devices, including said plurality of receptor sites (40) has a matching pattern with said another plurality of nozzles on said another transfer tool. J (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the matching nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The

motivation would have been to allow for simultaneous transfer of multiple devices with proper alignment, thus improving unit output.

60. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,742,561 to Nam et al. in view of U.S. Patent No. 6,511,048 to Bayan et al., U.S. Patent No. 5,904,545 to Smith et al. and U.S. Patent No. 4,914,809 to Fukai et al. as applied to claims 1, 3, and 6-17 above, and further in view of U.S. Patent No. 6,193,136 to Higashi et al.

61. With respect to claim 2, Nam et al. does not disclose a vibration device coupling to said transfer tool to agitate said transfer tool as said plurality of functional blocks are being deposited into said second plurality of receptor sites.

62. Higashi et al. discloses a component mounting apparatus, including a vibration device coupling to said transfer tool to agitate said transfer tool as said plurality of functional blocks are being deposited into said second plurality of receptor sites (column 7, lines 33-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the vibratory device taught by Higashi et al. with the transfer tool disclosed by Nam et al. The motivation would have been to allow for ultrasonic bonding (column 3, lines 25-29).

63. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,742,561 to Nam et al. in view of U.S. Patent No. 6,511,048 to Bayan et al., U.S. Patent No. 5,904,545 to Smith et al., and U.S. Patent No. 4,914,809 to Fukai et al.

as applied to claims 1, 3, and 6-17 above, and further in view of U.S. Patent No. 6,261,871 to Langari et al.

64. With respect to claim 4, Nam et al. does not specifically disclose a micro liquid dispensing device to dispense droplets of fluid-over said second plurality of receptor sites before said plurality of functional blocks are deposited into said second plurality of receptor sites.

65. Langari et al. discloses an apparatus for making flip-chips, including a micro liquid dispensing device to dispense droplets of fluid-over said second plurality of receptor sites before said plurality of functional blocks are deposited into said second plurality of receptor sites (column 8, lines 5-13). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the liquid dispensing device taught by Langari et al. with the apparatus disclosed by Nam et al. The motivation would have been to remove any contaminants and produce a stronger adhesion between the substrate and functional elements (column 8, lines 5-13).

66. As to claim 5, Nam et al. discloses an adhesive dispensing device (74) to dispense adhesive (68) into said second plurality of receptor sites in said substrate before said plurality of functional blocks are deposited into said second plurality of receptor sites (See Figure 4). However, Nam et al. does not specifically disclose a micro liquid dispensing device to dispense droplets of fluid-over said second plurality of receptor sites before said plurality of functional blocks are deposited into said second plurality of receptor sites.

67. Langari et al. discloses an apparatus for making flip-chips, including a micro liquid dispensing device to dispense droplets of fluid-over said second plurality of receptor sites before said plurality of functional blocks are deposited into said second plurality of receptor sites (column 8, lines 5-13). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the liquid dispensing device taught by Langari et al. with the apparatus disclosed by Nam et al. The motivation would have been to remove any contaminants and produce a stronger adhesion between the substrate and functional elements (column 8, lines 5-13).

68. Claims 23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,765,277 to Jin et al. in view of U.S. Patent No. 6,511,048 to Bayan et al. and U.S. Patent No. 6,830,946 to Yanagisawa et al.

69. With respect to claim 23, Jin et al. discloses a die bonding apparatus, including a transfer tool (51), said transfer tool to remove a plurality of functional blocks (57) formed on a first substrate from said first substrate and to transfer said plurality of functional blocks from said first substrate to the top side of a functional layer (i.e. tape; column 1, lines 44-57; See Figure 5). However, Jin et al. does not specifically disclose a plurality of nozzles on the transfer tool, a carrier on the bottom side of the functional layer, forming a second substrate, or a detachment station for detaching the carrier from the functional layer.

70. Bayan et al. discloses an off-load system for semiconductor devices, including using multiple nozzles which are in alignment with said first plurality of receptor sites in

the transfer tool (4; See Figure 1). The mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the plurality of nozzles in the transfer tool taught by Bayan et al. in the transfer tool of Jin et al. The motivation would have been to allow for simultaneous transfer of multiple devices, thus improving unit output.

71. Yanagisawa et al. discloses device transfer panel, including a carrier (5) on the opposite side of the functional layer (6), forming a second substrate (11), and a detachment station for detaching the carrier (5) from the functional layer (See Figures 1A-3C). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the carrier and second substrate taught by Yanagisawa et al. with the apparatus of Jin et al. The motivation would have been to provide support for the functional layer prior to attachment and provide further protection for the electronic article.

72. As to claim 25, the composition of the functional layer composition is interpreted as the material being acted upon in the apparatus. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Consequently, this limitation has not been given patentable weight.

73. As to claim 26, Jin et al. does not specifically disclose a pattern vias forming station for forming contact vias created in the bottom side of the photopatternable layer for electrical interconnections to the plurality of blocks.

74. Yanagisawa et al. discloses device transfer panel, including a pattern vias forming station for forming contact vias created in the bottom side of the photopatternable layer for electrical interconnections to the plurality of blocks (5; See Figures 4A-4C). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide vias in the functional layer as taught by Yanagisawa et al. The motivation would have been to provide electrical connection between the functional block and substrate, allowing the resulting device to function. The phrase, "after the carrier has been detached" directed to functional language. It is the examiner's position that Yanagisawa et al. meets the limitations of the instant claims. If the applicant were to establish that significant structural differences exist with the prior art apparatus which would make it incapable of performing the evacuation step and amend the claims appropriately, the art rejection over the apparatus claims will be withdrawn.

75. As to claim 27, the composition of the functional layer composition is interpreted as the material being acted upon in the apparatus. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Consequently, this limitation has not been given patentable weight.

76. The current application being a continuation-in-part of an earlier U.S. application or international application containing subject matter not supported by the original application. Any claims in the new application not supported by the specification and claims of the parent application have an effective filing date equal to the filing date of the new application. Any claims which are fully supported under 35 U.S.C. 112 by the earlier parent application have the effective filing date of that earlier parent application.

Response to Arguments

77. Applicant's arguments with respect to claims 1-23 and 25-29 have been considered but are moot in view of the new ground(s) of rejection. Applicant's remaining pertinent remarks are addressed below:

78. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues the table of Nam is flat, and therefore the combination Nam with Smith (or potentially Fukai) will only yield a flat wafer table. However, applicant is reminded the current rejection is under 35 U.S.C. 103 as obvious, not 35 U.S.C. 102 (b) as anticipation. Smith/Fukai are relied upon to teach a surface with indentations to secure individual blocks/chips. These teachings are relied upon to disclose receptor sites with recessed regions, not Nam et al. Applicant also argues the receptor sites of Smith are not apart of a relocation tool. However, Nam, the primary reference, is relied

upon to teach a relocation tool. Smith teaches the benefits of using recessed regions on a surface to position and stabilize the devices to be transferred. Consequently, this argument is not persuasive.

79. As to applicant's argument that the motivation to combine is improper, examiner disagrees. Smith teaches recessed locations for a surface would improve alignment of the devices. The indentations of the surface provide locations of increased stability which prevent bumps and vibrations from displacing the devices. This teaching is equally relevant to the disclosure of Nam, where a wafer table with the described recesses of Smith would contribute stability to the arranged chips of Nam. This combination would result in improved alignment, because the devices of Nam are more resistant to displacement. While this feature is not claimed by applicant, its benefits to the subsequent processing method are readily apparent, allowing for more accurate transferring and placement of the chips of Nam. Therefore, the motivation is proper, and the rejection is maintained.

80. As to applicant's argument that the wafer of Nam is not created in a fluidic assembly process, examiner agrees. However, it is noted that the features upon which applicant relies (i.e., a fluidic assembly process) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). One example of a positive recitation of a fluidic environment can be found in claim 13.

81. As to applicant's arguments against the rejection of claims 1, 9, 12, and 16-22 over Jin in view of various secondary references, see the above response.

82. In response to applicant's argument that the current claim interpretation is overly broad, applicant is directed to MPEP 2111, which states, "During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." See also MPEP 2111.01.

83. Applicant's current amendment is sufficient to overcome the previous rejections under 35 U.S.C. 103. However, new rejections under 35 U.S.C. 102 and 103 have been issued.

Conclusion

84. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY K. MCCLELLAND whose telephone number is (571)272-2372. The examiner can normally be reached on 8:00 a.m.-5 p.m. Mon-Thr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip C. Tucker can be reached on (571)272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kimberly K McClelland/
Examiner, Art Unit 1791

KKM

/Philip C Tucker/

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Supervisory Patent Examiner, Art Unit 1791